NATIVE PLANT PRESERVATION STANDARD

2-15.0.0 NATIVE PLANT PRESERVATION STANDARD.

2-15.1.0 GENERAL.

1.1 Purpose. This Standard is established to assure that proper techniques are used in all aspects of conforming with the Tucson *Land Use Code* (*LUC*) Native Plant Preservation Ordinance.

1.2 Definitions. Definitions for words used in this Standard are found in the Development Standards Glossary or in Sec. 6.2.0 of the *LUC*.

2-15.2.0 REQUIREMENTS FOR EXCEPTIONS. Applications of exceptions from the Native Plant Preservation requirements per Sec. 3.8.3.4.D and Sec. 3.8.3.4.E of the *LUC* are reviewed through a Type I Administrative Procedure, Sec. 5.4.3.1. Submittal requirements for that procedure require documentation that the site does not contain, or the proposed project does not impact, Protected Native Plants. Applications are made to the Development Services Department (DSD). Submittal requirements shall consist of one (1) or more of the following items.

A. An aerial photograph, taken within a maximum of three (3) years of submittal, of the site at a minimum 1" = 100' that delineates the site boundaries and clearly shows the absence of plants within those boundaries or a site plan or development plan that clearly shows that construction will not impact any plants. Any aerial photograph submitted, which was taken more than one (1) year prior to submittal, shall be accompanied by a letter stating that the site is substantially unchanged from the date of the aerial photograph.

B. A signed statement from one of the plant professionals listed in the *LUC*, Sec. 3.8.4.4, who has visited the site and verified that Viable Protected Native Plants are not located on the subject site.

C. Other documentation, acceptable to the DSD Director, which clearly indicates that the site does not contain, or the project will not impact, Protected Native Plants. Such documentation includes, but is not limited to, photographs of the site taken from all sides of the property and a signed statement from the property owner that Protected Native Plants are not located on the subject site.

2-15.2.0 REQUIREMENTS FOR EXCEPTIONS. (Cont'd)

D. Based on factors such as the size of the site, site location, topography, and proximity to significant natural features, the DSD Director may require submittal of specific items above.

2-15.3.0 NATIVE PLANT PRESERVATION PLAN SUBMITTAL STANDARDS. A Native Plant Preservation Plan shall consist of the information itemized below according to the preservation and mitigation methodology chosen by the applicant. Additional information may be required by the DSD Director in order to ensure that the purpose of Sec. 3.8.4, General Provisions and Requirements, of the *LUC*, is fulfilled.

3.1 Native Plant Inventory for the Plant Inventory Methodology, the Plant Appraisal Methodology, and the Combined Methodologies (Outside of Set Aside Areas).

A. A Native Plant Inventory containing the following elements:

1. All Viable Protected Native Plants shall be tagged with an embossed metal, or approved equal, inventory number. Tagging is not required in those areas that are to remain undisturbed. If the sampling method is used to estimate Protected Native Plants, only the Protected Native Plants required to be either Preserved in Place (PIP) or Transplanted on Site (TOS) shall be tagged.

2. A list of all Protected Native Plants as designated in Sec. 3.8.5 of the *LUC* located on the site including all Saguaros; all trees with a caliper of at least four (4) inches measured at six (6) inches for single-trunked specimens and twelve (12) inches for multitrunked specimens above grade level at the base of the tree, per Sec. 6.2.3 of the *LUC*; all shrubs equal to or greater than three (3) feet in height; all succulents equal to two (2) feet in height or greater; and all cacti. The list shall include the identification number, genus and species, and size. If the Plant Inventory Methodology is chosen, then the Native Plant Viability and Transplantability Status (see Sec. 2-15.3.2) of all Protected Native Plants on the site shall be listed. If the Plant Appraisal Methodology is chosen, then the appraisal value of each plant removed from the site shall be listed.

3. An aerial photograph, taken within a maximum of three (3) years of submittal, at a minimum scale of 1" = 60' showing the site's boundaries, the locations of all Protected Native Plants within those boundaries, and the plants' identification numbers keyed to the inventory list in Sec. 2-15.3.1.A.2. Any aerial photograph submitted, which was taken more than one (1) year prior to submittal, shall be accompanied by a letter stating that the site is substantially unchanged from the date of the aerial photograph.

3.1 Native Plant Inventory for the Plant Inventory Methodology, the Plant Appraisal Methodology, and the Combined Methodologies (Outside of Set Aside Areas). (Cont'd)

4. Areas of the site containing communities of Protected Native Plants with a low plant Viability rating (as in the case of plants damaged by fire, frost, flood, insects, disease, or other natural damage) may be evaluated as a group without inventory. These areas shall be clearly delineated and annotated on the aerial photograph inventory map.

5. Areas of the site may be sampled to estimate representative numbers of Protected Native Plants. These sampling techniques can be applied to any of the methodologies chosen to comply with the ordinance. Areas of the site must be inventoried by sampling typical identifiable areas for each genus and species and estimating representative plant numbers per square acre of the total site area. The samples must be representative of the Viable species found on-site and shall not be less than twenty (20) percent of the total site. If various plant associations (upland, riparian, xeroriparian, etc.) are found on one site, then a sample of not less than twenty (20) percent of each defined plant association, by its respective site area, shall be inventoried. Under any methodology, Ironwoods and Saguaros shall be inventoried individually and not by sampling. Staff reserves the right to reject sampling to establish an inventory of plant counts, on a case-by-case basis.

6. Sites that use the sampling method for inventory of Protected Native Plants will require field tagging of those plants to be PIP or TOS. All PIP plants must be identified on the aerial photo and must be tagged, flagged, and fenced. In a summary, the total number of plants, by genus and species, that must be PIP or TOS and the required mitigation numbers shall be listed. This summary shall be located on the NPPO plan and any associated Landscape/Mitigation Plan. Protected Native Plants to be TOS may be identified individually or in a "pool count." The "pool count," or total number of required TOS Protected Native Plants, shall match the totals in the summary and may vary according to field conditions; and therefore, final selection will be that of the "plant professional" and the salvage contractor. Once the total number of plants to be TOS, by genus and species from the summary, has been identified in the field, they must be tagged and flagged for TOS. Plants within a designated Natural Undisturbed Open Space (NUOS) area, under any method, do not require individual tagging or flagging since their boundaries will be fenced.

3.2 Native Plant Viability and Transplantability Status for the Plant Inventory Methodology. The Native Plant Viability and Transplantability Status shall be determined for each native plant of the minimum size and shall be used to determine numbers and locations of plants required for preservation.

3.2 Native Plant Viability and Transplantability Status for the Plant Inventory Methodology. (Cont'd)

A. *Plant Viability Criteria.* Plant Viability is based upon plant health, age, and form. Plants rated Low are not considered Viable and are not required to be assessed according to the Transplantability Criteria. Plants rated Medium or High are considered Viable and shall be assessed under the Transplantability Criteria.

1. *High.* A high plant Viability rating shall be assigned to plants meeting the following criteria:

a. *Health:* plant health is good to excellent with no major infestations of pests or apparent diseases.

b. *Age:* plant age is young or mature with a likely chance of long survival.

c. *Form:* plant is relatively undamaged with a healthy branching habit.

2. *Medium.* A medium rating shall be assigned to plants which do not meet all of the criteria for a high rating but have sufficient merit, in the opinion of the qualified professional conducting the inventory, to warrant preservation.

3. *Low.* A low plant Viability rating shall be given to plants meeting any one or more of the following:

a. *Health:* plant health is poor. Generally the result of severe infestations of pests or diseases or a lack of water over time.

b. *Age:* plant is in a state of decline, suggesting a low probability of lengthy survival.

c. *Form:* plant form and character is severely damaged. For trees, this may include new branches from large, old, dead trunks or weak branching habit.

B. *Plant Transplantability Criteria.* Plant Transplantability is based upon plant genus and species, size, soils, context, and topography. The following five (5) categories shall be inventoried to determine the ability to salvage the Viable plants which will not be preserved-in-place. Plants rated Low for Transplantability should not be considered for salvage and transplant. Plants rated Medium or High that are not preserved-in-place should be considered for salvage and transplant on-site or off-site.

1. *High.* A high rating for Transplantability shall be assigned to Viable plants which also meet the following criteria:

3.2 Native Plant Viability and Transplantability Status for the Plant Inventory Methodology. (Cont'd)

d. *Genus and Species:* has a high survival rate for reestablishment after transplant.

e. *Size:* overall plant dimensions are suitable for transplanting based upon the genus and species.

f. *Soils:* can be excavated, are cohesive, and seem capable of supporting the rootball system.

g. *Topography:* permits access with the appropriate equipment needed to remove plants and their rootball systems.

h. *Context:* adjacent plants do not pose a likely interference with root systems or interfere with plant removal.

2. *Medium.* A medium Transplantability rating shall be assigned to plants which do not meet all of the criteria for a high rating but do have sufficient merit, in the opinion of the qualified professional conducting the inventory, to warrant transplanting.

3. *Low.* A low rating for Transplantability shall be assigned to plants which also meet the following criteria:

d. *Genus and Species:* has a low survival rate for reestablishment after transplant.

e. *Size:* overall plant dimensions are not suitable for transplanting based upon the genus and species.

f. *Soils:* too rocky, sandy, or shallow to excavate a cohesive rootball system.

g. *Topography:* seriously limits access to the specimen by the appropriate equipment (i.e., steep slopes, rock barriers).

h. *Context:* adjacent plants interfere with removal or present likely conflicts with the rootball system.

3.3 Native Plant Analysis and Objectives for the Plant Inventory Methodology.

A. The **Analysis** of the inventory shall discuss in writing the criteria used to determine which plants and groups of plants will be preserved-in-place, salvaged and transplanted on-site, removed from the site, or destroyed, according to the plant status determined by the Native Plant Viability and Transplantability Status. Criteria may include, but are not limited to, health, vigor, wildlife value, environmental value, erosion control, soil structure, bedrock depth, slope, and the density and continuity of surrounding vegetation.

B. Based upon the analysis, a site plan, subdivision plat, or development plan shall be prepared to maximize achievement of the following prioritized objectives:

1. A site design which avoids disturbance of communities of Protected Native Plants and promotes the preservation-in-place of individual Protected Native Plants.

2. Transplanting on-site of salvaged Protected Native Plants into common areas; landscaped areas as required by the Landscaping and Screening Regulations (including into the future right-of-way areas identified by the City Engineer or designee that will not be utilized for future right-of-way improvements and with the City Engineer or designee's approval); disturbed wash areas; required retention/detention areas; disturbed landscape areas required to be revegetated, such as within Scenic Corridor Zones; and front yards of residential lots.

3. Salvage and transplanting off-site of any surplus Protected Native Plants which cannot reasonably be transplanted on-site.

3.4 Plant Preservation and Salvage Plan for the Plant Inventory Methodology.

A. A **Plant Preservation and Salvage Plan** on an aerial photograph, taken within a maximum of three (3) years of submittal, at a minimum scale of 1" = 60' showing the locations of the following. Any aerial photograph submitted, which was taken more than one (1) year prior to submittal, shall be accompanied by a note on the plans stating that the site is substantially unchanged from the date of the aerial photograph.

1. Limits of all areas to be graded.

2. Location of proposed roads and utility easements.

3. Existing topographic contours at two (2) foot maximum contour intervals.

4. Disposition of all Protected Native Plants keyed to the inventory list and showing the following designations:

3.4 Plant Preservation and Salvage Plan for the Plant Inventory Methodology. (Cont'd)

a. Plants to be preserved-in-place.

b. Plants to be salvaged and transplanted on-site. To the extent possible, plants should be transplanted directly to their permanent location on-site.

c. Plants to be salvaged and removed from the site.

d. Plants to be destroyed.

5. The location of a temporary holding nursery to be used for salvaged plants.

B. **Salvage and Mitigation Report** that details:

1. A summary by genus and species that details the total numbers of all Protected Native Plants inventoried.

2. The calculations used to determine, by genus and species, the numbers of replacement plants, if any, to be provided as mitigation for Protected Native Plants transplanted on-site, removed from the site, or destroyed. For assistance in determining these calculations, see ***Exhibit I***, Native Plant Preservation Worksheet. Any required landscape plans shall include a summary of plants required for mitigation and show their site location on the landscape plans. Any project that does not have required landscape plans shall have a landscape mitigation plan prepared to show the disposition of PIP, TOS, and required mitigation, as shown in the summary.

3. A schedule of salvage work to be accomplished including the timing and phasing of all tree boxing, tree and cacti salvage, and grading operations to take place on-site. See Sec. 2-15.4.0.

4. A method and schedule for providing irrigation to salvaged plants in a temporary holding area. A method and schedule for providing irrigation to PIP, TOS, and mitigation plant materials. A method to provide irrigation to plants may include water harvesting for areas that are to remain natural.

5. A method of protection from intrusion and damage for the natural vegetation outside the graded area. Specify fencing materials and methods for controlling access to the designated NUOS areas (minimum fencing requirements as specified in Development Standard 2-06.2.2.F).

3.5 Set Aside Submittal. The requirements of the Environmental Resource Report shall be fulfilled in the assessment of the area(s) of natural resource to be set aside as undisturbed natural open space in lieu of performing a Native Plant Inventory, Analysis, and Plant Preservation and Salvage Plan. In addition, an aerial photograph, taken within a maximum of three (3) years of submittal, is required at a minimum 1" = 100' delineating the natural resource values for areas on the site and the area(s) to be set aside which will be platted and included in Covenants, Conditions, and Restrictions (CC&Rs) as NUOS. Any aerial photograph submitted, which was taken more than one (1) year prior to submittal, shall be accompanied by a note on the plans stating that the site is substantially unchanged from the date of the aerial photograph.

2-15.4.0 SALVAGE AND TRANSPLANTING METHODOLOGY. These standards provide a general list of the many aspects of salvage and transplanting which shall be addressed by a contractor. Current standards and professional practices for the arid Southwest should always be followed.

The basic plant protection and salvage philosophy is to preserve-in-place as much native vegetation as possible and to utilize salvaged vegetation for landscaping in those areas that are graded or otherwise disturbed.

A. The salvage and transplanting operation shall be performed by a landscape contractor licensed in the State of Arizona.

B. For the salvage and transplant of trees, the Salvage and Mitigation Report should address the following items as applicable:

1. Season of the year.

2. Feasibility of successful salvage/transplant.

3. Pruning requirements before and after transplant.

4. Appropriate box size for salvaged material based on trunk diameter.

5. Side boxing techniques and timing.

6. Plant removal techniques and transportation techniques.

7. Maintenance in temporary holding nursery.

8. Permanent location planting techniques.

9. Long-term maintenance.

C. For the salvage and transplant of Saguaros and cacti, the Salvage and Mitigation Report should address the following items as applicable:

2-15.4.0 SALVAGE AND TRANSPLANTING METHODOLOGY. (Cont'd)

1. Season of the year.

2. Orientation of the plant at the original site and in the holding nursery. All Saguaros and cacti should be stored and transplanted in the same north-south orientation as they naturally grow in the desert to avoid sunburn. All Saguaros and cacti should be premarked on the south side before moving. Any size Saguaro and cactus can be planted in full sun if it was originally growing in full sun; otherwise, provide artificial shade for a season, or plant under a tree or shrub. Cacti which were not in full sun must be protected by shade cloth or other shade in the nursery.

3. Excavation of adequate root system.

4. Protection of epidermis with burlap, foam rubber, or other padding.

5. Support of the plant during salvage and transport.

6. Final planting techniques.

7. Maintenance in temporary holding nursery.

8. Long-term maintenance.

D. Protected Native Plants that do not survive the salvage process shall be replaced on a one-to-one basis (same size and species).

Sources of additional information include, but are not limited to:

International Society of Arboriculture
National Forestry Association
Arizona-Sonoran Desert Museum
University of Arizona Cooperative Extension
Desert Botanical Garden, Phoenix

2-15.5.0 TAGGING AND FLAGGING PROCEDURES. All Protected Native Plants that require tagging and flagging shall be addressed as outlined below:

A. All plants shall be tagged with an embossed metal, or approved equal, inventory number which cross references to the inventory list and aerial photograph and color-coded flagging according to the following schedule so that the disposition of each plant can be easily identified. Plants within fenced NUOS areas do not require tagging or flagging. Note that plants which are not Viable and are proposed for destruction require no tagging or flagging. Plants which are Viable and are proposed for destruction require inventory number tags and flagging.

2-15.5.0 TAGGING AND FLAGGING PROCEDURES. (Cont'd)

1. **Blue Flagging**: plants proposed for transplant on-site.

2. **Yellow Flagging**: plants proposed for removal off-site.

3. **White Flagging**: plants proposed for preservation-in-place.

B. Tags shall be located in a consistent, visible location on each plant. The initial inspection by City staff will be performed once the tagging, flagging, and/or fencing of NUOS areas has been completed and an inspection request has been received by City staff. A note shall be added to the plans that instructs the contractor/owner to call for the inspection.

C. Once affixed, the tags shall not be removed until the approved Native Plant Preservation Plan is implemented and a final inspection and sign-off has been performed by the project monitor and City staff. The tags shall be removed after final inspection.

D. The color-coded flagging legend shall be given to each crew supervisor and displayed on a poster in three (3) prominent locations on the project site for viewing by the public and construction crew personnel.

2-15.6.0 FENCING STANDARDS.

A. Fencing shall be required during construction for all undisturbed natural desert areas of Protected Native Plants and for individual Protected Native Plants to be preserved-in-place. The area to be fenced shall be beyond the "drip-line" of the vegetation by one-half (½) the distance of the "drip-line" radius. For Saguaros and cacti, the area to be fenced shall be equal to the distance of one-half (½) the height of the plant. The preservation of a substantial portion of the root system for either undisturbed natural desert areas of Protected Native Plants or individual Protected Native Plants preserved-in-place will improve the survival rate and health of these plants as well as preserve a portion of their associated plant community. Grading and construction that encroaches into the required root zone may be allowed on a case-by-case basis as determined by the Parks and Recreation Department Landscape Inspector depending upon the size and species of the Native Plant. Under no circumstances shall grading encroach to the base or trunk of a Native Plant.

B. The site developer shall include language in all contracts with contractors about the importance of staying out of all undisturbed natural desert areas and away from all individual Protected Native Plants to be preserved-in-place.

NATIVE PLANT PRESERVATION WORKSHEET

This worksheet outlines the steps needed to calculate numbers for meeting the minimum standards, preservation credits, and mitigation requirements of the Native Plant Preservation Ordinance utilizing the Plant Inventory Methodology. This Worksheet has been designed to assist in calculating the numbers of plants needed for the Salvage and Mitigation Report described in Sec. 2-15.3.4.B; however, this particular Worksheet is not required as part of the submittal but the calculations are required (see Sec. 2-15.3.4.B.2). Fill out a separate worksheet for every genus and species of plant.

Abbreviations and Definitions used:
PIP = plants preserved-in-place
TOS = plants transplanted on-site
RFS = plants removed from site, damaged, or destroyed
Mitigation = additional plants to be planted on-site

NAME OF PLANT (GENUS AND SPECIES) _____

STEP ONE **Minimum Requirements for PIP or TOS**

1. Number of plants of this genus and species inventoried and rated viable: _____ ***(1)***

2. Multiply line 1 by the appropriate number below.
When the result includes a fractional amount, .1 - .4 is rounded down to the next lower whole number, and .5 - .9 is rounded up to the next higher whole number.

Saguaros and Ironwood trees .5 x _____ = _____
Other Plants .3 x _____ = _____

Enter the minimum number of PIP and/or TOS required here:
_____ ***(2)***

3. Enter total number of plants proposed to be PIP: _____ ***(3)***

4. If line 3 is less than line 2, subtract line 3 from line 2 and enter here: _____ ***(4)***
If line 3 is more than or equal to line 2, enter 0.
This is the minimum number of plants required to be TOS.

5. Enter total number of plants proposed to be TOS: _____ ***(5)***

6. Subtract line 4 from line 5 and enter here: _____ ***(6)***
This is the number of "excess" plants to be TOS.

7. Add line 3 and line 5 and enter here: _____ ***(7)***
This is the total number of plants that will remain on the site.

8. Subtract line 7 from line 1 and enter here: _____ ***(8)***
This is the total number of plants proposed for RFS.

STEP TWO **Preservation Credits for Plants PIP**

9. Multiply the number of plants PIP, based on plant size, by the appropriate multiplier below and enter here. **Add the total, for each plant, and enter the total preservation credits here.** _____ ***(9)***

Saguaros 6-10' high	2 x	_____	=	_____
Saguaros >10' high	3 x	_____	=	_____
Ironwood trees 6-12" in caliper	2 x	_____	=	_____
Ironwood trees >12" in caliper	3 x	_____	=	_____
Barrel Cacti >2' high	2 x	_____	=	_____
Other Cacti >4" high	2 x	_____	=	_____
Ocotillos >6' high	2 x	_____	=	_____
Yuccas >2' high	2 x	_____	=	_____
Other Trees 6-14" in caliper	2 x	_____	=	_____
Other Trees >14" in caliper	4 x	_____	=	_____
Shrubs >6' in height or diameter	2 x	_____	=	_____

STEP THREE **Mitigation Requirements for Plants TOS and RFS**

10. Enter number of plants from line 4 here: _____ ***(10)***
This is the mitigation requirement for the required number of plants TOS.

11. Multiply the number of plants from line 8 by the appropriate multiplier below and enter result here: _____ ***(11)***
This is the mitigation requirement for plants RFS.

Saguaros and Ironwood trees:	3 x	_____	=	_____
Other plants:	2 x	_____	=	_____

12. Add line 10 and line 11 and enter total here: _____ ***(12)***
This is the total number of plants required for mitigation.

STEP FOUR **Net Mitigation Requirements**
This step balances the preservation credits and requirements.

13. Subtract line 6 from line 12 and enter here: _____ ***(13)***
This is mitigation requirement reduced by "excess" plants TOS.

14. Subtract line 9 from line 13 and enter here: _____ ***(14)***
This is mitigation requirement reduced by preservation credits.

15. If amount on line 14 is greater than 0, enter number here: _____ ***(15)***
If amount on line 14 is 0 or less, enter 0 here (no mitigation is required for this plant).
This is the number of mitigation plants that must be provided.

16. Add line 7 and line 15 and enter number here: _____ ***(16)***
This is the total number of plants (of this genus and species) that will be on the site.